

# JEWELL

A.C.-D.C. SET ANALYZER  
PATTERN 199

\$97<sup>50</sup>

**BEST PRICE**





## Accurate Tube Test Available

(Through "C" Battery Connected to these Posts)

¶ In testing devices of this general type in the past, a tube test has been made by shifting the grid over to one side of the filament. This gave a tube test only in case the grid already had a bias, since if it was connected to the filament directly, no change in grid voltage was obtained. Further, the tubes connecting the grid to the filament caused a very excessive current to flow, which could hardly be called a good tube test, and usually indicated off scale on the instrument.

¶ The Jewell Pattern No. 199 Set Analyzer is supplied with a clip and binding post for a small "C" battery (obtainable anywhere at 40 cents list) and the set is so wired that when the grid test is made this battery is placed in series with the grid circuit and serves to shift the grid voltage 4.5 volts positive. This gives a very definite change in the plate current on all tubes and under all conditions. It cannot possibly damage a tube, neither can it cause the milliammeter to go off scale. A chart is supplied in the instructions, giving definite values to be expected for all types of tubes in making this test, this data having been compiled from the very latest sources.

¶ The tube test in the Pattern No. 199 is the most definite test on tubes ever made available in set testing apparatus of this sort.

¶ The small "C" battery is also available for a continuity test by connecting in series with one of the voltmeter readings. A pair of test leads are supplied for such work and continuity tests to locate open circuits or shorted condensers can be carried through with no extra apparatus.

## Six-Reading D. C. Volt-Milliammeter

(7.5—75—300 and 600 Volts—15 and 150 Milliampères)

¶ The direct current instrument contains a movement of the D'Arsonval type of exceptionally high quality with its moving coil swung between genuine sapphires and adjusted to an exact sensitivity of 1000 ohms per volt. The 7.5 volt range is used for direct current filament readings, the 75-volt range for grid and cathode voltage, and the 300 and 600-volt ranges for plate voltage. The high resistance of the instrument allows voltage readings to be taken without distorting set conditions, and at the same time the accuracy of the readings is high because of the accurate calibration and the 75 division scale with fine lines and the knife edge pointer. Figures for all ranges are shown on the scale, which eliminates possible errors in reading.

¶ As a milliammeter, the instrument has ranges of 15 and 150 milliampères, either of which can be used to indicate plate current.

¶ All of the above six ranges are available at the binding posts, which are properly marked so that there is no question as to the proper connections to be made to measure any external voltage or current. This makes the set available for the laboratory and it can be used for the measurement of "B" eliminator voltages—for example, total plate current draw of a set, and the like.

¶ Where it is desired to measure currents above 150 milliampères, small shunts may be obtained at a list price of \$2.50 each, which are connected to the lower right hand binding posts. Ranges of .3, .75, 1.5, and 3 amperes are available, and on special order, still higher range shunts can be made. These shunts are quite small and several of them can be carried in the adapter compartment.

## Silver Contact Push Button Switches

(Positive—Quick—Easy)

¶ Push button switches of the locking type are used throughout in the Jewell Pattern No. 199 Analyzer. They were selected as the best type for rapid operation. Other less expensive types of selector switches are available, but they will be found to be slower in operation, less positive in action, and generally less desirable. With push button switches the desired reading may be obtained immediately.

¶ These switches are of the double pole type, the springs are of a special grade of phosphor bronze and the contacts are of Sterling silver. Silver is the only commercial material suitable for such contacts, and the fact that Sterling silver is used is alone indicative of the quality of this piece of apparatus.

¶ Each push button (except the "GRID TEST" button) has a white line engraved on it, which, when vertical, indicates that the switch is out. Readings may be obtained merely by pressing the proper button, and if it is desired to leave the circuit on, the button can be rotated slightly to lock it. Another slight rotation causes it to release for the next reading.

¶ After manufacturing thousands of testing devices of this general type, we are firmly convinced that a push button switch made in this manner is by far the most satisfactory type of switch, both from the viewpoint of ruggedness and simplicity as well as from the service man's point of view—speed of action.





## Jewell Analysis Charts

¶ Jewell analysis charts have been supplied with all recent Jewell test sets, and a pad is enclosed with each Pattern No. 199 Analyzer.

¶ These charts are an exclusive feature originated by Jewell, and service men find them of great value. It is practically impossible to remember the different readings taken in checking all the tubes in a set, but with Jewell charts a record is made as each reading is taken (see example chart below). With a complete record of all readings and tube values it is comparatively easy to determine the source of trouble.

¶ Dealers also find that these service charts are of great value in rendering bills for service calls. A carbon copy should be made of each service chart and enclosed with the bill to the customer. The original should go into the dealer's files for future service reference. These charts help dealers and their service men in conducting their service departments profitably, and set owners are always impressed and pleased with the efficient and business-like manner of the entire transaction.



## Jewell Service Manuals

¶ In addition to the 16-page Jewell Service Manual furnished with each No. 199 Analyzer, we are also printing individual manuals for servicing the sets of 18 of the leading manufacturers.

¶ In comparing our No. 199 A.C.—D.C. Analyzer with other test sets, bear in mind the following Jewell features:

- A—Five-prong plug for complete 227 tube test.
- B—Push button type switches.
- C—Black Morocco covered case.
- D—Jewell analysis charts and manuals.
- E—Continuity test is always available, using grid battery.
- F—Filament voltages are taken at socket terminals; no compensation necessary for drop in leads.
- G—Six D.C. and four A.C. ranges, each having a complete set of figures; no calculations necessary.
- H—Knife edge pointers.
- I—\$97.50 price—with dealer's discount.

RADIO SET ANALYSIS									
OWNER <u>H. J. Marshall</u>			DATE <u>Aug. 15 '27</u>						
ADDRESS <u>1015 Prairie Ave, City.</u>									
NAME OF SET <u>6 tube tuned R.F., with eliminator</u>									
TUBE NO. IN ORDER	TYPE OF TUBE	POSITION OF TUBE 1ST. R.F., DET., ETC.	READINGS, PLUG IN SOCKET OF SET						
			TUBE OUT OF TESTER		TUBE IN TESTER			NORMAL PLATE M.A.	PLATE M.A. GRID TEST
A VOLTS	B VOLTS	A VOLTS	B VOLTS	C VOLTS					
1	201-A	1st R.F.	5.2	95	5.0	90	0	5.3	11.1
2	201-A	2nd R.F.	5.2	95	5.0	93	0	0.2	0.3
3	201-A	3rd R.F.	5.2	95	5.0	90	0	5.2	10.8
4	201-A	Detector	5.6	45	5.0	45	0	1.7	5.5
5	201-A	1st audio	5.4	0	5.0	0	4.5	0	0
6	171	2nd audio	5.2	157	5.0	150	41.0	5.0	off scale
7									
8									
9									
10									

SUGGESTIONS OR CHANGES MADE New tube in socket #2. Repaired break to plate of 1st audio tube socket. Boosted B voltage on last tube.

BY Smith Radio Shop. - A.R. West.

**JEWELL ELECTRICAL INSTRUMENT CO.**

1650 WALNUT STREET

CHICAGO, U. S. A.

AIN REGULAR DEALER'S DISCOUNT





Jewell  
Radio  
Service

## "28 Years Making Good Instruments"

- ¶ Switchboard instruments for industrial work.
- ¶ Portable instruments for laboratory testing.
- ¶ Radio instruments for amateur, set builder, broadcast station and service men.
- ¶ Special instruments for unusual applications.



## JEWELL RADIO TEST BENCH

¶ Many requests from jobbers and dealers have come to us for a service panel or bench which would contain, inter-connected, all the instruments necessary to completely check the circuits and general working condition of radio receiving sets and accessories. The Jewell Pattern No. 580 Radio Test Bench has been designed for that purpose.

¶ The bench proper is substantially made of hard maple with a top of generous size 24x42" and is 36" high. A tool drawer is included.

¶ The testing panel is steel, black enameled, with all markings engraved directly in the steel. The panel carries seven large flush type instruments, uniform size, 4 1/8" diameter with a 5 3/4" flange diameter, with ranges as follows: 0—7.5 volts D.C., 0—75 volts D.C., 0—150—300—750 volts D.C., 1,000 ohms per volt; 0—15—150 D.C. milliamperes, 0—4—8—16 volts A.C., 0—150—750 volts A.C., and 0—1.5—15 microfarads.

¶ The panel is supplied with binding posts so that all instruments can be used individually, and with switches to cover all ranges. It is also supplied with a plug and cord like our Pattern No. 199, so that all circuits in a radio set can be tested along with the tube, which may be placed in a socket in the panel. A pair of outlets are arranged to be connected to the 110-volt, 60 cycle A.C. line so that line voltage may be read and a set plugged into the outlets.

¶ The 750-volt A.C. range enables testing power pack secondaries for open circuits and the capacity meter which gives direct readings at 115 volts 60 cycles provides an efficient method of determining condenser values and checking condensers for short circuit.

¶ This Radio Test Bench is a well made, carefully designed and practical piece of equipment which jobbers and dealers who have a large quantity of servicing to do will find very efficient as a part of their testing equipment. Large, precision type instruments with long scales can be read to a high degree of accuracy.

¶ Higher ranges, individual and simultaneous reading of instruments, together with greater accuracy of readings as occasioned by the longer scales and knife edge pointers, are some of the advantages provided by this test bench which cannot be well built in as a part of a portable testing instrument such as our Pattern No. 199.

Test Bench No. 580, complete as shown . . . . . \$278.50 \*\*

ORDER THROUGH JOBBER AND OBT





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1650 WALNUT STREET

CHICAGO, U. S. A.

MAIN REGULAR DEALER'S DISCOUNT



## **Genuine Morocco Covered Case (Cover Removable)**

¶ The Jewell Electrical Instrument Co. has been making radio testing equipment for many years and is thoroughly familiar with the various types of radio sets in use today. The Jewell Pattern No. 199 radio set Analyzer has been designed with a full knowledge of the requirements of the service man. With the instruction book supplied, intelligent service may be rendered by any radio man; the expert service man will find the Pattern No. 199 will allow him to double his service calls because of the enormously increased facility for taking all readings and making all tests.

¶ The Jewell Pattern No. 199 radio set Analyzer operates on the principle of plugging into each vacuum tube socket in turn with the tube from that socket in the Analyzer. Readings are taken of the current and voltage conditions in all circuits, giving a true picture whereby the trouble is indicated by the deviation from normal conditions.

¶ The containing case is  $9\frac{1}{8} \times 11\frac{1}{8} \times 3\frac{7}{8}$  inches and is built from high-grade laminated ply wood covered with genuine imported black Morocco leather. Leather covered cases will withstand the rigors of continuous day in and day out usage far better than any other type of case, and while quite expensive, this type of case is supplied by the Jewell Electrical Instrument Co. in order to give the service man an instrument which will give him long use and still continue to look well.

¶ Slip hinges are used, permitting the easy removal of the cover. This is a distinct advantage where crowded conditions are encountered by a service man in using the Analyzer, either in the home, dealer's salesroom, or repair shop.

¶ The electrical details which follow are vital to the proper servicing of all types of sets and may be compared with any device on the market at any price for completeness and detail.

## **Five-Prong Plug (With 4-Prong Adapter)**

¶ To properly test modern Five Prong Tubes and their associated circuits in a radio set, it is absolutely necessary to carry back five complete circuits. This is done in the Pattern No. 199 Set Analyzer, and a Five Prong Plug is supplied, which carries back the cathode voltage separately and allows the accurate reading not only of filament voltage, plate voltage and grid voltage, but also of cathode voltage. Plate and grid voltages are read to the cathode and the cathode and heater are allowed to assume their normal potential relations with each other. Some other types of testing devices tie the cathode to the heater before making the test, resulting in distorted voltage conditions and tests which do not indicate the facts.

¶ Furthermore, filament voltage is read directly at the socket terminals through an extra pair of leads carried in this cord, hereby giving true voltage conditions at the socket. No compensation has to be made for voltage drop in the leads and true conditions in a radio set are indicated. Where Four Prong Tubes are to be tested, adapters are supplied, which serve to take care of the four circuits in correct relation. Alternating current sets are the prevailing type. Practically all such sets use a Five Prong Tube at least for the detector, and many use Five Prong Tubes throughout. The desirability of checking such sets with a device which indicates the relations between all circuits is obvious.

¶ The plug is equipped with a 4-foot extra flexible cord, allowing the Analyzer to be placed in a convenient position for making all of the checks.

¶ Adapters for testing screen grid tubes, Kellogg tubes, and other special types are available, so that the new Pattern No. 199 Analyzer may be truly considered a universal instrument.

## **Four-Reading A. C. Voltmeter (4, 8, 16 and 160-Volt)**

¶ The alternating current voltmeter supplied in the Pattern No. 199 Set Analyzer is supplied with four ranges to completely cover all requirements. The 4-volt range gives excellent readings on the 1.5 and 2.5 volt tubes and also for such 3-volt tubes as may be operated on alternating current. The 8-volt range will cover the 5-volt tubes operated on alternating current, such as the 171, and will also take care of the filaments of the 210 and 250 types of tubes, as well as the filaments of the 280 and 281 rectifier tubes. The 16-volt range is valuable for reading the open circuit voltage of filament transformers and will be found necessary where higher voltage tubes of the Arcturus type are to be tested. The 160-volt range is supplied for checking line voltage.

¶ A 5-foot cord equipped with a standard attachment plug is supplied and arranged to connect to the lower left hand pair of binding posts. When plugged into the line and the 160-volt push button is pressed, the actual line voltage is indicated on the 160-volt scale. The line voltage must be correct if correct results are to be obtained, and many sets are now equipped with taps on the power transformer or some other device for adjusting the set to the line conditions.

¶ In addition to the 160-volt reading, the three low voltage ranges are also available at the binding posts where they may be used for checking the secondary of low voltage transformers for filament lighting.

¶ An 80-division scale, silver etched, with black characters, is supplied on the instrument, with a complete set of figures for every range, eliminating the necessity of mental calculations. The knife edge pointer is valuable in making accurate readings.